

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)**

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No
PCT/CA2004/000026

International filing date (day/month/year)
15.01.2004

Priority date (day/month/year)

International Patent Classification (IPC) or both national classification and IPC
B01J20/26, B01J20/28, B01D17/04, B01D17/02, C02F1/40

Applicant
ENVIRONMENTAL APPLIED RESEARCH TECHNOLOGY ...

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

0/541180

International application No.
PCT/CA2004/000026

JC20 Rec'd PCT/PTO 30 JUN 2005

Box No. 1 Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/CA2004/000026

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Yes: Claims 7,8,10-17,19,20,22,24-26

No: Claims 1-6,9,18,21,23,27-34

Inventive step (IS)

Yes: Claims

No: Claims 1-34

Industrial applicability (IA)

Yes: Claims 1-34

No: Claims

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:
D1: WO 02/20115 A (EARTH CANADA CORP ; BENACHENOU AMINE (CA); PARENT JEAN PIERRE (CA)) 14 March 2002 (2002-03-14)
D2: US-A-4 230 566 (FAUDREE III THOMAS L) 28 October 1980 (1980-10-28)
D3: US-A-3 913 513 (PEDONE VITO S) 21 October 1975 (1975-10-21)
D4: US-A-4 256 573 (SHIMODAIRA CHIAKI ET AL) 17 March 1981 (1981-03-17)
D5: US-A-3 797 666 (AZUMA S ET AL) 19 March 1974 (1974-03-19)
D6: US-A-4 115 266 (OHSHIMA KATSUTOSHI) 19 September 1978 (1978-09-19)
D7: US-B-6 391 4481 (GEISER KURT M) 21 May 2002 (2002-05-21)
2. The present application does not meet the requirements of Article 33(1) PCT, because the subject-matter of claims 1 to 34 is not new in the sense of Article 33(2) EPC or does not involve an inventive step in the sense of Article 33(3) PCT in view of at least one of the following documents (cf. the passages quoted in the search report).
3. D1 is the most relevant document. This former application of the applicant discloses a method of separating non-aqueous phase from aqueous phase using a sorbing coalescing agent. The coalescing agent can be particulate foam obtained by cutting a larger polymer foam block (page 13, lines 1-4). The pores of the foam have normally a diameter in nanometric range according to claim 3 of the application. Polymers according to claim 29 of the application are mentioned. In view of the content of D1, at least the subject-matter of claims 1 to 6, 27 to 30, 33 and 34 lacks novelty

In view of D1 taken alone, the subject-matter of the other claims does not involve an inventive step. The application does not comprise evidence that the operating conditions for the formation of the particulate sorbing material according to claims 7 to 11 and 18 to 23 provide either an unexpected technical effect or solve a different technical problem, the subject-matter of these dependent claims does not involve an inventive step over the disclosure of D1. The same applies to the subject-matter of claims 12 to 17 the application failed to demonstrate that

disintegrating the polymer block by abrading with a sandpaper instead of cutting with blunt cutters should provide an unexpected technical effect. It is also submitted that the application is silent with regard to the technical effect which could have been achieved by selecting a density according to claim 7 of the application, or the operating conditions of the separation method according to claims 24 to 26.

4. The subject-matter of at least claims 1, 3 to 6, 9, 18, 21, 23, 27 to 30 and 33 (cf. more particularly figure 5). The particulate sorbing material is obtained by cutting a foamed polymer block, preferably polyurethane, and its use for adsorbing hydrocarbons present in water.

The application does not provide evidence that the operating conditions of the operations of the preparing method in general (claims 7-11), or the cutting method in particular (claims 19, 20, 22) provides a technical effect over the disclosure of D2. The method according to claims 12 to 17 is an alternative to the method of claims 18 to 23, which does not provide any technical advantage. Therefore, the subject-matter of claims 7 to 23 does not involve an inventive step over the disclosure of D2 taken alone.

The subject-matter of claim 2 (size of the sorbent pieces) and 24 to 26 and 34 (use of said sorbent in a process for separating hydrocarbons from water) does not involve an inventive step in view of the combination of D1 and D2.

5. The preparation of particulate sorbing coalescing material according to claims 1 to 6, 27 to 30 and 33 is also known from D3. The particulate material is obtained by cutting larger foamed polymer block. The teaching of D3 confirms that of D2.

The same applies in view of D4, which refers also to particulate sorbing material obtained by cutting foamed polymer block (column 6, lines 24-55).

These two documents confirm that the method of preparing the particulate adsorbing materials according to claims 6 to 11 and 18 to 23 is quite common in the art. Abrading with coarse sandpaper is regarded as a technical alternative, which does not provide unexpected technical effect. The application is at least silent about it, so that it should not be possible to later based inventive step on a newly defined potential technical effect provided by the use of abrading with

sandpaper.

6. D5 to D7 are cited to show that sorbing coalescing materials as claimed in the application can present various shapes, and were already known in the technical field of the invention for recovering hydrocarbons from water.
- 6a. D5 discloses the subject-matter of claims 1 to 5, and 30 to 33, and the method of separation according to claim 34 of the application. The sorbent material is provided as packing pieces (2 to 20 mm) made i.a. of polymer fibers, polyolefins being preferred (1 to 100 μm in diameter).
- 6b. D6 discloses the use of polymers in form of flakes without specifying the density and the porosity. It takes away the subject-matter of at least claims 1, 2, 4 and 5 and the method of separation according to claim 34 of the application.
- 6c. D7 discloses the use of beads having scarified surfaces (roughened surfaces). The scarification have dimensions in the nanoscale range. The subject-matter of at least claims 1 to 5, 30 and 33 is anticipated. The use according to claim 34 does not involve an inventive step in view of D1 and D7.
- 6d. These documents show that there is a need, if not to delete, at least to strongly restrict the definition of the sorbing coalescing material of claim 1 of the application. A lack of unity objection might then be expected, if the applicant failed to define a common linking concept between the sorbent material, the preparation method and the use of said sorbent, which will be novel and inventive.

Re Item VII

Certain defects in the international application

1. The order of the claims does not comply with the requirements of Article 6 and Rule 6 PCT. Claims of the same category should be grouped, therefore, claims 30 to 33 should follow claim 5, and claims 24 to 26 should follow claim 34, because claims 24 to 26 only comprises technical features concerning the use of the particles and not their physical or chemical characteristics. Claims 24 to 26 should not referred to claim 6, which subject-matter if the method of preparation of the sorbing agent.

Re Item VIII

Certain observations on the international application

1. The size parameters of the sorbing agent is apparently an essential feature of the invention. These size should be introduced into claim 1 (Article 6 PCT; conciseness).
2. The subject-matter of claim 1 is defined by the result to be achieved.
- 2a. The term "reusable" is not a characteristic of the sorbent, but is relative to the conditions of its use (chemical compatibility with the hydrocarbons to be separated). This term does not differentiate the subject-matter of the claim over other sorbent or particulate materials as long as they present the physical and chemical features indicated in the description (chemical nature of the polymers, sizes of the particulate materials, coarse shapes).
- 2b. The same applied to the terms "coalescing" or facilitating the separation of non-aqueous phase from an aqueous phase".
3. The term "polarizable" in claims 4 and 28 does not introduce any restriction within the subject-matter of the preceding claims referred to. Either the term can be considered as a definition by the result to be eventually achieved (but not is actually not achieved) in which case the claims are not admissible in terms of Article 6 PCT, or the feature is implicit for the polymers listed in claim 29 and the subject-matter can be considered as lacking novelty or inventive step in view of the cited prior art.
4. The wording of claim 6 is not clear and concise (Article 6 PCT).
- 4a. Cutting a sorbing coalescing material of the type needed for the intended use inevitably increases the surface area of material and consequently the coalescing effect. This feature in claim 6 is redundant and should be deleted.
- 4b. The type of density is apparently not defined. It is not clear in the application whether it should be the pack density of the particulate material, or the intrinsic density of the sorbing material on its own. This feature should not be considered

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International application No.

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when considering the novelty and the inventive step.